
 <b>E-TECH Testing Services, Inc.</b> 3617 B Cincinnati Avenue Rocklin, CA 95765 PHONE (916) 645-8188 FAX (916) 645-3853	<b>Windshield Deformation Assessment</b>	Doc. No.  <i>Windshield_damage.doc</i>	Issue Date:  7/13/99
<b>Operating Procedure</b>	Prepared by: J. F. LaTurner Approved by: <i>John F. LaTurner</i>	Revision: 0	Page:  1 of 3

1. **Purpose:** This procedure is used to measure windshield deformation in conjunction with assessing NCHRP 350 occupant risk evaluation criteria.
2. **Scope:** This procedure involves measuring windshield deformation on a crash test vehicle subsequent to testing. Deformation is established by comparing deformed windshield measurements to corresponding measurements on the windshield of an undamaged reference vehicle.
3. **Definitions:**
  - 3.1. **Windshield Damage** – Refer to NCHRP 350 Occupant risk evaluation criteria and subsequent FHWA memorandum concerning guidelines for evaluating damage to a windshield.
4. **Equipment and Reference:**
  - 4.1. Strait edge and standoffs (1 ½" square Unistrut tubing with 3/8" standoff bolts or equal)
  - 4.2. Tape measure
  - 4.3. Reference vehicle (untested vehicle of same make, model, and year of crash test vehicle)
  - 4.4. Windshield Deformation Data Form - (*windshield\_damage\_form.doc*)
5. **Equipment Setup**
  - 5.1. Visually examine the damaged windshield and locate the point of maximum deformation. Measure and record the lateral and vertical position of maximum deformation relative to suitable fixed reference points on the perimeter of the windshield (see Figure 1). If there is some doubt as to which areas have maximum deformation, take measurements in all suspect areas.



**Figure 1.**

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- 5.2. Transfer the location(s) of suspected maximum deformation to the windshield of the reference vehicle and mark them (see Figure 2.)

Figure 2.




- 5.3. Adjust the distance between the straight edge standoffs so that they align with a suitable (fixed) reference point on the windshield perimeter (see Figures 3 and 4.)

Figure 3.





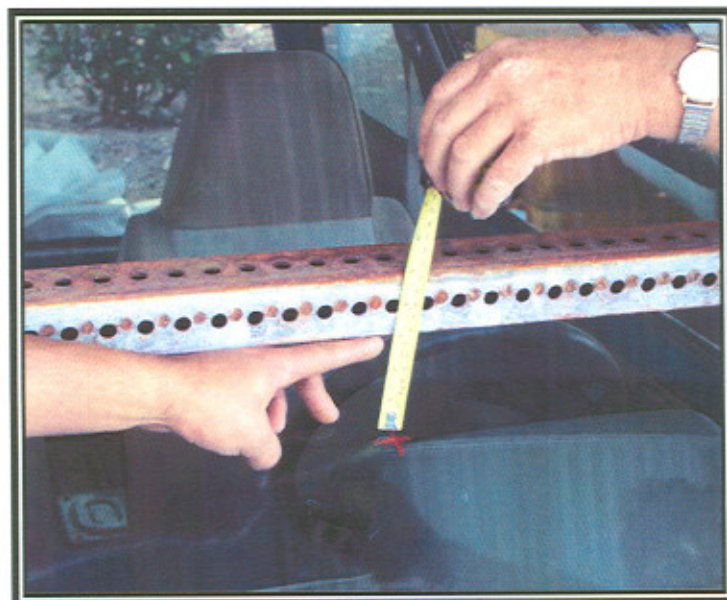
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- 5.4. Returning to the crash test vehicle, align the straight edge above the area of maximum windshield deformation (see Figure 4.) Holding the fixture perpendicular to the windshield surface, measure the distance from the bottom edge of the fixture to the windshield surface and record it on the form *windshield\_damage\_form.doc*. Repeat the measurement process on the reference vehicle (see Figure 5.) Subtract the dimensions to establish the maximum windshield deformation and location.

**Figure 4.**



**Figure 5.**





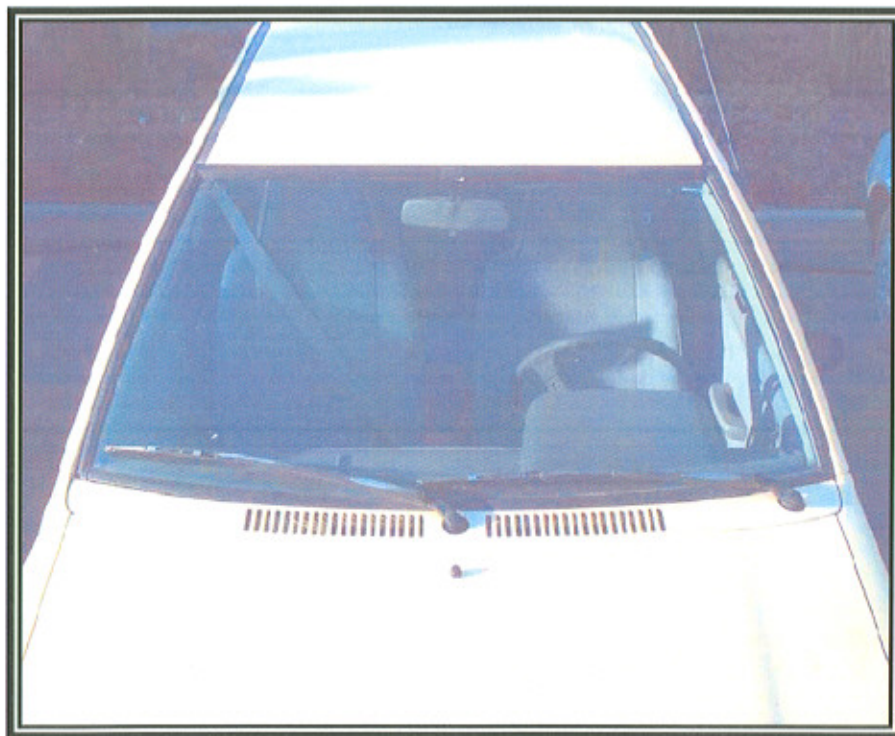
**E-TECH Testing Services, Inc.**  
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## WINDSHIELD DAMAGE DATA FORM

E-TECH Test No. \_\_\_\_\_

Date Measured: \_\_\_\_\_

Measured by: \_\_\_\_\_



### **Instructions:**

Refer to Operating Procedure "Windshield Deformation Assessment" (windshield\_damage.doc).

1. Fill in the test number, date, and initial this from.
2. Draw directly on the photograph at left to indicate the location(s) of windshield damage and the corresponding vertical and horizontal fixed reference points.
3. Clearly label each location and record in column 1 in the table below.
4. Measure the vertical and horizontal reference dimensions to each location in columns 2 and 3 (include units of measurements).
5. Measure the distance(s) from the straight edge fixture to the windshield surface on both the crash test and reference vehicle then record them in columns 4 and 5.
6. Subtract the crash and reference vehicle measurements and record the difference in column 6.
7. Circle the maximum windshield deformation and submit the completed form to the Supervisor.

Location #	Vertical Ref. Dim.	Horizontal Ref. Dim	Crash Vehicle Meas.	Ref. Vehicle Meas.	Deformation